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ABSTRACT

Data reported by the U.S. Department of Labor, Bureau of Labor Statistics, and Bureau of the Census, and a literature review were used to develop comparative descriptive profiles of the employment status of white U.S. minorities in the workplace. In addition, these data were used to show the progression of African Americans into the workplace from the 1940s onward, especially the progression from service occupations to white-collar occupations concomitant with the passage of civil rights and affirmative legislation from the 1940s to the 1960s. Data assessed covered a broad period from 1900 through projections into the year 2000. Findings from these data sources indicated that multicultural diversity in the workplace is an idea whose time has come. Simply passing legislation does not ensure that meaningful integration and inclusion will occur. Management must set the tone and climate at the workplace and be committed to the integration and inclusion initiative. Many major U.S. corporations have taken that position and have begun multicultural affirmative action and recruiting programs. Data were summarized and specific recommendations were made to improve the conditions of minorities in nontraditional work roles. (Contains 12 references.) (Author/KC)

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# A SYNOPSIS OF MINORITIES IN THE WORKPLACE: 1900 - 2000

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**ABSTRACT**

Data reported by the U.S. Department of Labor, U.S. Bureau of Labor Statistics, U.S. Bureau of the Census, and perusal of the professional literature were used to develop comparative descriptive profiles at the employment status of white U.S. minorities in the workplace. Data assessed covered a broad period from 1900 through projections into the year 2000. Findings from these data sources indicated that multicultural diversity in the workplace is an idea whose time has come. Simply passing legislative enactments does not ensure that meaningful integration/inclusion will ensue. Management must set the tone and climate at the workplace and be committed to the integration/ inclusion/initiative. Data were summarized and specific recommendations were made to improve the conditions of minorities in nontraditional work roles.

**A SYNOPSIS OF MINORITIES IN THE WORKPLACE: 1900-YEAR 2000**

**INTRODUCTION**

According to John Axelson (1985) in his book, Counseling and Development in a Multicultural Society, prior to World War I, minority groups did not participate in the industrial system. Almost 80% of all African American workers were employed in agriculture. Ninety percent of all African Americans lived in the South and the great majority of Hispanics lived in the Southwest. Until World Wars I and II, both groups exhibited minimal presence in the industrial workforce.

When Henry Ford introduced the first assembly line in 1913, production was revolutionized and less training, less skill and less experience, if not less education in workers was required. Even the pattern of this industrial production has been changing over the past 30 years and what has emerged has been a new technology, a technology commonly called, "high technology." Sophisticated technology has replaced simpler tools and industrial process. Computerized systems and industrial robots are replacing manual labor; microelectronic devices and processes affect all aspects of society. The new/high technology has accelerated the need for more highly educated and technically trained workers, one using mental power rather than machine or manual power. Ordinary mental power is even being displace by artificial intelligence.

These changes have implications for Management especially in the areas of contraction, retrenchment, and displacement when co-workers are more likely to turn on each other rather than to turn to each other.

Changes created by the new/high technology work environment, an environment in which computer literacy and technical literacy constitute second language systems, will necessitate a re-evaluation of the role of human labor in the workplace. Concomitantly, new population elements (i.e., women, racial and ethnic minorities) are constituting larger percentages of the workforce and portend to ultimately constitute even large percentages of that work in the three major occupation areas of managerial and professional specialty, technical sale and administrative support, and service occupations. These current labor statistics do not reflect the composition of the labor pool 30 years ago.

Table I (three pages) indicates these demographic changes.

## Integration of Minorities

Integration, like equality and freedom, is conceived in entirely different terms by those defining the concepts. Like equality and freedom, integration is a "process" assuring equal opportunities and a "result" assuring freedom from vulnerability that invites cynical exploitation and manipulation (Farley, 1983). The national multicultural

experience of integrating minority groups into the workforce has been a slow process (Naisbitt & Aburdene, 1990). As a result, integration of minority groups, especially African Americans, the disabled and women, into the workforce continues to be examined and challenged.

In support of integrating women and minorities in the federal agencies, Kellough (1990) study revealed that integration is indicated by the percentage of minorities and women employed. He further stated that agency size and the number of blue collar or clerical positions appear to be contributing factors in the number of minorities and women employed.

Over the last three decades black women and minorities have shown significant gains in the labor market. Much of the gains have been made in the clerical field. This field outranks all other fields since 1940 for employing black women (King, 1993). Data from the U.S. Bureau of Labor Statistics (1983) confirm the findings of King. Ninety-eight point 2 percent (98.2%) of women were secretaries, and ninety-nine percent (99%) were typists.

Based upon this trend in minority employment, Banach (1990) predicted that by the year 2000, eight out of every ten new entrants to the workforce will be minorities, immigrants, or women. In order to meet this challenge, management will need to provide workers with training in cultural diversity. Age, education, sexual, socioeconomic,

and racial factors must constitute the training sessions.

This axiom is especially relevant insofar as African Americans are concerned, for their unique contributions to the world of work. At the end of the Civil War a vast majority of African Americans were employed as either farm laborers or domestic service workers. By 1890, when data on African American occupational status were first collected, nearly 90% of African American workers were still concentrated in agriculture and domestic service occupations. According to the United States Department of Labor, Bureau of Labor Statistics, only 60% of Euro American workers were so employed.

Since the beginning of the Twentieth Century there has been a steady shift among African American and Euro American people away from agriculture and domestic service occupations, but the shift of Euro American workers has been even greater, thus the occupational gap between Euro American and African American workers has persisted and in some cases widened (Sowell, 1991).

The greatest change in occupational status of African Americans occurred between 1940 and 1970, when federal, state, and municipal governments enacted laws forbidding the traditional discriminatory practices against African Americans (Franklin & Moss, 1988). In fact, the Civil Rights Act of 1964 and the Civil Rights Act of 1968 were the most far reaching and comprehensive laws in support of

racial equality. Essentially, these federal laws, not only prohibit discrimination in public and private employment based on race, religion, sex, or national origin, but also require that employers take positive steps to assure that any continuing effects of past discrimination are remedied (U.S. Commission on Civil Rights, 1971). As a result of increasing employment opportunities, significantly greater numbers of African Americans were integrated and employed in "white-collar" skilled occupations (Sowell, 1991).

These statistics do not reflect the significant numbers of blacks and minorities who earn less than their white counterparts in most occupations. Census data, as reported by Dortch (1994), confirm the above. These data showed that at all educational levels, including college, blacks earn less than their white counterparts in most occupations. There are fewer blacks than whites in higher-paying white collar positions, even though blacks may have comparable education. Percentage wise, blacks' earnings range from 81% to 88% of white men. Percentages for black women earnings are higher than men. The chief reason for this salary difference, according to the author, is that the industries in which blacks are employed are lower paid, and employers want blacks who will "fit the mode" and not make waves.

Labor Department Statistics reported by Tucker (1994) concerning women in the workplace showed that black professional women outrace black professional men 2 to 1

incorporate America. This ratio does not negate the fact that black women in the workplace still trail black men by 14 percentage points.

In spite of State and federal laws outlawing discrimination in the workplace, these studies and statistics clearly show that reforms are needed, if equal employment opportunities are to be realized and achieved by women and minorities. One of the major changes needed to improve the occupational status of women and minorities in the workplace, is to improve degree offerings. Women and minorities should be counsel to seek additional degrees in the math and science areas. Data from the chronicle of higher education show that women are undereducated in all fields, but the greatest are in the math and science areas.

Tables II (two pages) and III show degree areas.

According to the data supplied by the tables, foreign students received 42.4% of all of the degrees awarded in America in 1989. While many of these foreign engineering graduates will elect to remain in the United States, can the American economy be predicated on this? Does this fact alone suggest some implications vis a vis personnel availability and utilization?

Suffice it to say, in any event, whether or not foreign engineering graduates begin to make up larger and larger percentages of the available trained engineers in the workforce or not, this available labor pool will become

exponentially more multicultural.

## Legislative Mandates

Legislative mandates have minorities get their feet in the door to occupations whenever they had liberty not been represented. Among these were the following legislative enactments: (1) Title VII of the Civil Rights Act of 1964; (2) The Age Discrimination in Employment Act, and the 1978 and 1986 amendments disallowing mandatory retirement; (3) The Equal Pay Act of 1963 which prohibits sex discrimination in pay; (4) The Rehabilitation Act of 1973, as amended in 1978 to include alcoholism as a handicapped; (5) The Americans With Disabilities Act of 1990: (6) The Civil Rights Act of 1990 and, (7) State and local laws, some of which add protection for marital status and sexual orientation.

These foregoing legislative mandates have permitted categories of persons who were either systematically excluded from certain workplaces and job markets or practically excluded from them by custom and usage to enter these workplaces and job markets to enter them. Some of these new entries still suffer from unassimilated and precarious existence circumstances. For these persons threats of unacceptability are a way of life, an integral part of their persisting life situations. The task remaining before the Nation is their incorporation into the structures and functions of these work environments.

## DISCUSSION

Much of the research reviewed indicated that communication was perceived as a serious problem for minorities in the workplace. What can be done to alleviate the impacts of this problem? To attempt to design and structure mechanisms for ensuring that initiatives and directives relating to racial discrimination are communicated with clarity and directness is a gargantuan task. As such, it is intricately intertwined with the current state-of-the-art of communication vis a vis the way things are normatively communicated in the work environment.

Suffice it to say, managers and supervisors do not have the option of only communicating directives, notices, and other items of information with which they are in essential agreement. There is also a little thing that is termed in theatrical circles as "for the good of the show" - the whole show, the totality of the experiences in the work environment. Managers can assuredly be apprised and reapprised of their responsibilities to the work organization and for its roles and mission. This also has implications for selection, review, performance appraisal, and promotion of managers, supervisors, and co-workers. Simply stated, communications is a work environment or corporate culture item.

While upper echelon command cannot institutionalize or regiment communication styles, there are do's and don'ts

that can be structured. All workers can be, at least to an extent, acculturated toward using proper communication styles and systems. When the tone and climate of the workplace is geared towards instilling proper attitudes and actions in communications, co-workers, supervisors and managers sit up and take notice. When proper communication styles are stressed and expected to become integral elements in the ambiance and the appurtenances of the armentarium of managerial acumen. Proper communication capability is a sine qua non upon which managerial expertise hinges. Communications acuity is one of the essential elements in management. It can be taught by precept and example. It is part and parcel or managerial capabilities of effective and sophisticated managers, the types of managers that must be developed if the problems of racial discrimination are to be resolved.

Obviously some modeling is mandated. What is proper communication style? Can it be developed? The term political correctiveness, not in terms of what it has commonly been regulated to in the common language vernacular, but in its original connotation, comes into play here. Sexist language, snide, off color remarks, sexually suggestiveness are communications that should be overtly discouraged and prohibited. In this context, it becomes easy to say what co-workers, supervisors and managers should not do than to say what they should do.

Managers and supervisor should not use the communications system as a privileged system to which only members of the "good old boy network" have access. The free flow of information to all who might benefit from it or be affected by it is a must element. Upon this hinges and is predicated any semblance of cohesiveness in the work environment. Official rules and prohibitions as well as directives should amplify the importance of proper communication in the workplace. Multicultural training is essential to effect communication.

The 18th Annual Jobs Issue of the Black Collegian March/April Issue (Bullock, 1992) captioned the remarks of ten business leaders concerning their rationales for instituting multicultural diversity programs in their work organizations, hereinafter called, "Managing Diversity." These persons were: (1) Vernon R. Lovecks, Jr., CEO and Chairman of Baxter International; (2) George H. Heilmeir, President and CEO of Bellcare; (3) Frank Popoff, CEO of DOW Chemical Company; (4) George A. Knechtel, Vice President of General Motors Corporation; (5) Richard M. Flynn, Chairman New York Power Authority; (6) Eric Milledge, President Ortho Pharmaceutical; (7) C.J. Silas, Chairman and CEO Phillips Petroleum Company; (8) Comer J. Cottrell, President and CEO Pro-Line Corporation; (9) M. Anthony Burns, Chairman, President, and CEO Ryder Systems, Inc.; and (10) Jean Pierre Garner, President Smithkline Beecham... Only Comer J.

Cottrell was a minority; he was an African American.

Vernon R. Loucks, Jr. indicated that at Baxter they were committed to achieving a balanced workforce. He related that since the U.S. Labor Department issued Workforce 2000 in 1987, Baxter has been making workforce diversity a critical priority. He further alluded to the fact that, putting attitudes and philosophies aside, cultural diversity in the workplace is first and foremost a competitive issue. He further stated that by the year 2000, only 15% of the new entrants in the workforce will be white males. He believes that if his corporation does not start developing - not just hiring, but developing - more minority talent now, Baxter will not be able to maintain its leadership in the industry, a leadership which it has worked so hard to achieve over the last 60 years. He also stated that to be globally competitive, Baxter has to be able to operate in environments that are radically different from the United States. He believes that if Baxter continues on its present course, it will eventually become a truly multicultural system, one embracing celebrating and managing multicultural diversity.

Bellcare, headed by George H. Heilmeir, provide research services, engineering, and other technical services to the telephone company of American technology. Among its clients and associates are: Bell Atlantic, Bell South NVNEX, Pacific Telesis, Southwestern Bell Corporation, and

US West, as well as Cincinnati Bell Telephone Company and Southern New England Telephone Company. He stated that since its inception in 1984, Bellcare has not only worked hard to recruit and hire the best talent available, but also to create and maintain a supportive work environment that recognizes and nurtures the skills of every employee. He believes that managing workforce diversity means empowering employees who come to Bellcare from a wide variety of backgrounds to maximize productivity and enhance customer satisfaction. He believes that managing diversity requires adapting and modifying behaviors through the development of effective managerial skills. He pointed out that Bellcare actively seek out underrepresented minorities in science and engineering.

Frank Popoff (1992) pointed out that DOW Chemical Company employs over 62,000 people; this makes it the second largest chemical company in the United States and sixth in the world in terms of sales. In 1987, Popoff states that his company responded to the Hudson Institute's Workforce 2000 by attempting to determine how it could best develop a workforce characterized by cultural diversity. The company official then formed a Diversity Steering Committee to study the program. This Committee recommended long-term strategies geared toward continuous improvement. These company officials surveyed other companies, state and local governments, and advocacy groups to identify major issues

and recommendations that come in. They also established two teams, a Minority Issues Team and a Women's Issues Team and gave them the charge and charter to study issues and make recommendations. These teams had immediate access to upper management. Implemented was a program termed, "Managing Development and Diversity."

The General Motors Corporation which employs 400,000 persons also controls such subsidiaries as GMAC, EDS and Hughes. This CEO pointed out that over 46% of all the vehicles in the United States are purchased by women and 8% are purchased by minorities (with the largest percentage being purchased by African Americans). Currently 31% of all GM's salaried workers are either minorities or women (21% are women and 14% are minorities). They also believe in expanding minority presences and in-puts by contracting for goods and services provided by minority vendors.

C.J. Silas, Chairman and CEO of Phillips Petroleum Company, pointed out that 10 years ago the "oil patch" consisted primarily of white males; today it is a fully integrated workforce peopled by American Indians, Hispanics, African Americans, Asians, and a greater percentage of female workers. The Phillip's Diversity Program was established because 20% of the Phillip's workforce is made up of minorities and women. Over 40% of the new hires have been women or minorities.

Coner J. Cottrell of Pro-Line pointed out that the goal

of creating a diverse workforce has been a priority of high officials for a number of years. Other CEO's and high officials, M. Anthony Burns of Ryder Systems, Inc., Jean Pierre Carner of Smith Kline Beecham, are all champion managing diversity programs.

On the authority of data supplied by the U.S. Department of Labor and the U.S. Bureau of the Census and literature searches, the reviewers are recommending interpersonal and multicultural training for all managers and supervisors. There is now extant ample research data that provides guidance and instruction in designing, implementing, and conducting these models and paradigms.

Some managers and supervisors who are technical giants are also interpersonal pygmies. As a result, basic interpersonal skills must be taught as an integral part of multicultural/human relation skills. Without these multicultural, interpersonal, and human relation skills managers or supervisors can not be expected to motivate a successful workforce.

A mentoring program has many advantages for promoting human relation skills. In an article titled "Real Life in Corporate America," in the Black Collegian Magazine, the author Edward W. Bullock (1992) admonishes all new hires in professional fields to get themselves a mentor and to develop a close working relationship with him/her. He points out that if one is to succeed in corporate America,

he/she must know the rules. Simply stated, he/she must understand the corporate climate, understand the importance of the work environments rules and rituals, its rights of passage, its developmental tasks, and must be able to translate hidden messages (sometimes mixed messages), heed and obey signals and to translate covert understandings and institutional mind sets. Sometimes these rules are communicated over lunch or on the golf course.

Bullock believes that if one is not chosen to work on special projects, he/she should ask his/her mentor if this mentor can intervene. Bullock believes that a new entrant, especially one in a professional or technical field, either learns the easy way through his/her coach/mentor or the hard way through trial and error. This mentor is important to the process of developing a track record.

Bullock believes that new entrants do not select mentors; mentors usually select persons to be mentored. Nevertheless, some companies do have systems of assigning mentors to new entrants. Mentors, hence, develop the next generation of managers, supervisors, and administrators. They generally select persons who show early promise. They psychologically travel with these protegees through the developmental experiences and stages. Mentors, says Bullock, empower and motivate their charges. They are usually persons of vision and hard workers with exemplary track work records. Mentors usually conscientiously believe

in excellence. According to Bullock, mentors foster growth and development. It is, hence, very important for disciples to use them as sounding boards. They are the prisms through which new hires and entrants can filter their ideas.

Comprehensive mentorship programs and participating in these are not new phenomena to highly educated and professionally trained scientists, engineers, and technicians. Hence, management should borrow liberally from extant models and paradigms of mentorship. There is no reason to re-invent the wheel in this instance. Validated and replicated practices taken from the experiences of other fields and disciplines should be incorporated into this model. As both survey respondents and focus group attendees lamented the fact that they were not initially assigned mentors, the powers in command should accommodate them by filling this void and addressing this perceived need.

Because experiencing success in the capacity of managerial and supervisory roles is so intricately predicated on the acquisition and development of human relations skills to be utilized in the workplace, the reviewers are recommending that these become performance appraisal items. At intervals at which the performances of managers/supervisors are evaluated, the human relations skills that the manager or supervisor has incorporated and displays should be reviewed along with other aspects of his/her performance in the workplace. Managers and

supervisors who have received large numbers of complaints emanating from their units or shops should be confronted with these and required to explain in writing the reasons they attribute to the volume of complaints issued against them and/or supervisees in their shops or work units.

These managers and supervisors should also be required to state in writing what kinds of corrective actions they have taken and/or are currently taking. Performance reviewers should take seriously all complaints and allegations despite the fact that some will doubtlessly be unfounded. The end goal here is to apprise managers and supervisors of their responsibilities for promoting morale, cohesiveness, and a commitment to establish work goals in their respective workshops in order to reduce conflict.

As indicated previously, conflicts can inevitable be expected to arise in the work organization as well as in other organizations. At times these conflicts will stem from advertence between the personal and professional goals of employees and the goals and objectives that attenuate management's role and mission. Obviously in the instances of these kinds of conflicts, the goals and objectives of management must prevail and be prioritized otherwise additional conflicts will arise from the relations and interactions of employees and their co-workers and supervisors and managers.

As dispute resolution is a managerial skill, it can be

taught to all employees at all echelons and levels. Organizational cohesiveness being a result and a function of productivity and morale and feelings of well-being in the organizational structure, conflict resolution should be stressed at all junctures (recruitment, induction, assignment, performance review and appraisal, retention, promotion, etc.). It naturally follows that the acquisition of skill and acumen in conflict resolution is an on-going skill activity. In initial interviews for possible employment newly hired workers must be made cognizant of their personal responsibilities for seeking to develop relations of comity and cooperation with co-workers, supervisors, and managers.

At the same time, all employees must be apprised of the fact that upper echelon command takes seriously its responsibility for protecting the essential human rights of all employees and that the rights of minorities in Non-Traditional Work Roles is no exception.

The end goal is to resolve disputes and conflicts as forthrightly and promptly as possible, preferably at the echelon where they occur. Also the goal is to resolve disputes as informally as possible. This can best be done in a work atmosphere wherein it is communicated to workers who perceive that they have been personally injured by the actions and reactions of co-workers, supervisors and managers that their just and appropriate complaints,

allegations, and grievances will be redressed.

Why do minorities in Non-Traditional Work Roles perceive that the processes are not working? The essence of the answer to this question appears to lie in questions in reference to timeliness, dispatch, and the alleviation of fears of retribution. Here again, managers and supervisors are an amplification key. Training, review, and performance appraisal are all parts of the configuration or gestalt. Directives and notices must be updated, augmented, and communicated from the context of zero tolerance finality. They must become elements in pre-service and in-service training. Personnel in positions of responsibility must be sensitized regarding their importance and cruciality. Managers whose work environment is afflicted by factors that deter productivity, can hardly be adjudged as good, excellent, or outstanding if they have not directed the appropriate degree of interest, effort, and energy to the resolution of these complaints and allegations.

Timeliness and promptness in resolving conflicts and disputes should be rewarded; slowness and lack of dispatch and forthrightness in resolving them should be negatively viewed.

In order to ensure that human rights of minorities are protected in the workplace, it is proposed that the structuring of on-the-job opportunities for meetings and discussions of common actual and perceived problems be

conducted. It is the contention of the reviewers that such meetings will serve as avenues for clarifying and exploring perceived threats of gender discrimination and sexual harassment.

The goal relating to the setting up of these support systems and networking meetings is not to cushion the impact of justly derived complaints and allegations, nor to short circuit the processes that attenuate the registering of both formal and informal complaints. It is rather to offer morale support and concrete advice to persons who perceive that they are being victimized by racial discrimination. These meetings would serve as prisms through which these perceptions could be filtered. Work release time would be afforded to attendees of these meetings. Unit supervisors and managers would meet frequently with representatives of these meetings. This would afford them avenues and opportunities to become proactive in addressing problems of gender discrimination rather than reactive. This would allow them to nip impending and potential problems in the bud before they become actual problems.

Some type of systematic system is needed to serve as a follow up mechanism. A cybernetic model is proposed. The cybernetics model affords feedback regarding how well the model or paradigm is working. Additionally, it will pinpoint specific areas of weakness. A computerized flow chart will be established to store, retrieve, and analyze

these data.

The effecting of a feedback mechanism for assessing how efficacious the seven-point intervention program is for impacting the problem(s) under study is a necessary prerequisite. This model depicts in-puts (complaints, conflicts, allegations, etc); it also shows the process or thru-put component (the seven point intervention plan); out-put encompasses the resolutions process (how conflicts, complaints, allegations, etc., are ultimately resolved). Feedback represents the data flow information on how these resolutions would feedback to the appropriate echelon command. The schemata of this model or paradigm is depicted in Figure 1.

A computerized system for documenting and classifying cases of alleged gender bias and sexual harassment would be set up. At all times and at all points within the in-put/thru-put/out-put/feedback loop, involved persons would be able to track the case and to assess its status. Upper echelon administrators would be able to access the case at any point. Junctures at which there appears to be bottle necks and gridlocks would be identified. Units or shops from which large numbers of cases are coming could be identified.

Flow charts of the intervention model/paradigm would reflect monthly and year-end statistics. Both process (formative) and products (summative) evaluations would be

conducted annually. The former evaluation, formative evaluation, would be used to analyze the structures and functions of the intervention design in order to assess its efficacy for attaining project objectives. The latter type of evaluation (summative) would be used to assess outcome variables (disposition of cases) and the out-put of the several elements in the model/paradigm individually and collectively.

It is the best judgement of the reviews that, collectively and individually, these recommendations if implemented will reduce the impact of gender discrimination and sexual harassment in the workplace.

According to the U.S. Department of Labor American business now and for the remainder of the 20th century will face a drastically different labor market than the one to which they have been accustomed for many decades. Traditional sources of labor are rapidly shrinking...Businesses will be able to satisfy their labor needs only if they successfully empower individuals presently outside the economic mainstream to take advantage of meaningful employment.

The economic and labor force changes already under way in the United States will require American business and industries to revise their thinking in a major way. Companies wishing to hire and retain the most talented workers will need to develop innovative strategies directed

toward the "new workforce," persons who will comprise an increasing share of available labor in the year 2000.

There must be consciousness raising directed toward apprising upper echelon administrators, managers, and supervisors of the immediacy of the problem of fully and meaningfully integrating minorities into all facets of the work environment. What must be stressed is that this is an imperative action. The demographic characteristics of the American population impel us to this action.

If management is to efficiently and effectively humanize the workplace, it must draw from this available labor pool and fully utilize the human resources of that labor pool. Legislative mandates notwithstanding, the demographic mix of the workforce dictates adherence to the inclusion/integration initiative.

As a direct result, the importance of this inclusion/integration initiative must be amplified via directives, notices, pamphlets, and other documents. It must also be stressed in-service and pre-service and orientation sessions. It must become a living document in terms of its efficacy as a selection and performance appraisal instrument for co-workers, supervisors, and management.

The current scene of integration of African Americans into the workforce has and continues to have a major influence (Wilson, 1987). This renown sociologist, noted in

the 1980s, that "trained and educated blacks, especially the younger ones who have recently entered the labor market, and experiencing unprecedented job opportunities. These job opportunities may be attributed mostly to the initiatives outlined. As society advances toward the Twenty-First Century, Naisbitt and Aburdene (1990), in Megatrend 2000, report more organizations and institutions must generate a well-written affirmative action plan which incorporates a mechanism for ensuring total interactive/integration in the workplace for all.

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## No. 637. Employed Civilians, by Occupation, Sex, Race, and Hispanic Origin: 1983 and 1993

For civilian noninstitutional population 16 years old and over. Annual average of monthly figures. Based on Current Population Survey; see text, section 1, and Appendix III. Persons of Hispanic origin may be of any race.

| OCCUPATION | 1983 | | | | 1993 | | | |
|---|---|---|---|---|---|---|---|---|
| | Total employed (1,000) | Percent of total | | | Total employed (1,000) | Percent of total | | |
| | | Female | Black | Hispanic | | Female | Black | Hispanic |
| Total | 100,834 | 43.7 | 9.3 | 5.3 | 119,306 | 45.8 | 10.2 | 7.3 |
| Managerial and professional specialty | 23,592 | 40.9 | 5.5 | 2.6 | 32,290 | 47.3 | 6.5 | 4.0 |
| Executive, administrative, and managerial | 10,772 | 32.4 | 4.7 | 2.3 | 15,376 | 42.0 | 6.2 | 4.5 |
| Officials and administrators, public | 417 | 38.5 | 8.0 | 3.8 | 581 | 45.2 | 11.0 | 4.5 |
| Financial managers | 357 | 38.9 | 3.5 | 3.1 | 529 | 46.2 | 4.4 | 4.2 |
| Personnel and labor relations managers | 106 | 40.9 | 4.9 | 2.6 | 36 | 50.7 | 7.9 | 4.6 |
| Purchasing managers | 92 | 23.6 | 5.1 | 1.4 | 109 | 24.3 | 6.0 | 5.0 |
| Managers, marketing, advertising and public relations | 396 | 21.9 | 2.7 | 1.7 | 496 | 31.2 | 2.1 | 2.5 |
| Administrators, education and related fields | 415 | 41.4 | 11.3 | 2.4 | 525 | 59.9 | 13.0 | 3.8 |
| Managers, medicine and health | 91 | 57.0 | 5.3 | 2.0 | 450 | 70.5 | 5.5 | 4.2 |
| Managers, properties and real estate | 305 | 42.8 | 9.5 | 5.2 | 481 | 45.7 | 9.6 | 6.3 |
| Management-related occupations | 2,956 | 40.3 | 5.8 | 3.5 | 4,155 | 52.7 | 7.5 | 4.5 |
| Accountants and auditors | 1,105 | 38.7 | 5.5 | 3.3 | 1,387 | 49.2 | 7.0 | 4.2 |
| Professional specialty [1] | 12,920 | 48.1 | 6.4 | 2.5 | 16,904 | 53.2 | 7.0 | 3.6 |
| Architects | 103 | 12.7 | 1.6 | 1.5 | 123 | 18.6 | 3.1 | 2.0 |
| Engineers [1] | 1,572 | 5.8 | 2.7 | 2.2 | 1,716 | 8.6 | 3.7 | 3.5 |
| Aerospace engineers | 80 | 6.9 | 1.5 | 2.1 | 80 | 7.5 | 2.1 | 3.9 |
| Chemical engineers | 57 | 5.1 | 3.0 | 1.4 | 58 | 10.3 | 2.5 | 4.9 |
| Civil engineers | 211 | 4.0 | 1.9 | 3.2 | 221 | 9.4 | 4.7 | 3.8 |
| Electrical and electronic | 450 | 6.1 | 3.4 | 3.1 | 533 | 7.5 | 4.5 | 3.4 |
| Industrial engineers | 210 | 11.0 | 3.3 | 2.4 | 201 | 16.4 | 3.4 | 4.4 |
| Mechanical | 259 | 2.8 | 3.2 | 1.1 | 296 | 5.2 | 4.4 | 3.3 |
| Mathematical and computer scientists [1] | 463 | 29.6 | 5.4 | 2.6 | 1,051 | 32.4 | 6.0 | 2.5 |
| Computer systems analysts, scientists | 276 | 27.8 | 6.2 | 2.7 | 769 | 29.9 | 5.8 | 2.4 |
| Operations and systems researchers and analysts | 142 | 31.3 | 4.9 | 2.2 | 236 | 39.7 | 6.3 | 3.0 |
| Natural scientists [1] | 357 | 20.5 | 2.6 | 2.1 | 531 | 30.1 | 3.6 | 1.9 |
| Chemists, except biochemists | 98 | 23.3 | 4.3 | 1.2 | 133 | 29.8 | 4.3 | 3.0 |
| Geologists and geodesists | 55 | 16.0 | 1.1 | 2.5 | 54 | 14.0 | 1.0 | 2.1 |
| Biological and life scientists | 55 | 40.8 | 2.4 | 1.8 | 114 | 40.4 | 3.9 | 1.4 |
| Health diagnosing occupations [1] | 735 | 13.3 | 2.7 | 3.3 | 909 | 20.5 | 3.0 | 3.9 |
| Physicians | 519 | 15.8 | 3.2 | 4.5 | 505 | 21.9 | 3.7 | 4.6 |
| Dentists | 126 | 6.7 | 2.4 | 1.0 | 152 | 10.5 | 1.9 | 3.0 |
| Health assessment and treating occupations | 1,900 | 85.8 | 7.1 | 2.2 | 2,502 | 86.4 | 8.3 | 3.5 |
| Registered nurses | 1,372 | 95.8 | 6.7 | 1.8 | 1,859 | 94.4 | 8.4 | 3.2 |
| Pharmacists | 158 | 26.7 | 3.8 | 2.8 | 187 | 38.1 | 6.1 | 2.7 |
| Dietitians | 71 | 90.8 | 21.0 | 3.7 | 94 | 92.8 | 17.5 | 5.0 |
| Therapists [1] | 247 | 76.3 | 7.5 | 2.7 | 416 | 74.9 | 6.9 | 4.1 |
| Inhalation therapists | 69 | 69.4 | 6.5 | 3.7 | 92 | 58.4 | 10.0 | 6.9 |
| Physical therapists | 55 | 77.0 | 9.7 | 1.5 | 115 | 72.5 | 3.0 | 5.0 |
| Speech therapists | 51 | 90.5 | 1.5 | - | 83 | 91.8 | 6.7 | 1.2 |
| Physicians' assistants | 51 | 36.3 | 7.7 | 4.4 | (S) | (S) | (S) | (S) |
| Teachers, college and university | 606 | 38.3 | 4.4 | 1.8 | 772 | 42.5 | 4.8 | 3.1 |
| Teachers, except college and university [1] | 3,365 | 70.9 | 9.1 | 2.7 | 4,097 | 75.1 | 8.6 | 3.6 |
| Prekindergarten and kindergarten | 299 | 98.2 | 11.8 | 3.4 | 501 | 97.7 | 11.7 | 5.0 |
| Elementary school | 1,350 | 83.3 | 11.1 | 3.1 | 1,668 | 85.9 | 9.3 | 3.9 |
| Secondary school | 1,209 | 51.8 | 7.2 | 2.3 | 1,237 | 57.5 | 6.9 | 3.1 |
| Special education | 91 | 82.2 | 10.2 | 2.3 | 286 | 84.0 | 10.1 | 2.3 |
| Counselors, educational and vocational | 184 | 53.1 | 13.9 | 3.2 | 224 | 57.6 | 14.3 | 6.9 |
| Librarians, archivists, and curators | 213 | 84.4 | 7.8 | 1.6 | 223 | 83.5 | 6.2 | 3.8 |
| Librarians | 193 | 87.3 | 7.9 | 1.8 | 196 | 88.3 | 7.0 | 3.5 |
| Social scientists and urban planners [1] | 251 | 46.8 | 7.1 | 2.1 | 399 | 57.0 | 5.9 | 3.3 |
| Economists | 98 | 37.9 | 6.3 | 2.7 | 117 | 47.8 | 4.8 | 3.5 |
| Psychologists | 135 | 57.1 | 8.6 | 1.1 | 241 | 64.1 | 7.1 | 3.1 |
| Social, recreation, and religious workers [1] | 831 | 43.1 | 12.1 | 3.8 | 1,096 | 50.5 | 15.6 | 5.0 |
| Social workers | 407 | 64.3 | 18.2 | 6.3 | 586 | 68.9 | 21.4 | 8.0 |
| Recreation workers | 55 | 71.9 | 15.7 | 2.0 | 99 | 75.1 | 14.8 | 4.7 |
| Clergy | 293 | 5.6 | 4.9 | 1.4 | 350 | 11.4 | 8.7 | 3.1 |
| Lawyers and judges | 651 | 15.8 | 2.7 | 1.0 | 815 | 22.8 | 2.8 | 2.1 |
| Lawyers | 612 | 15.3 | 2.6 | 0.9 | 777 | 22.9 | 2.7 | 2.1 |
| Writers, artists, entertainers, and athletes [1] | 1,544 | 42.7 | 4.8 | 2.9 | 2,026 | 48.6 | 5.3 | 4.7 |
| Authors | 62 | 48.7 | 2.1 | 0.9 | 109 | 57.2 | 2.4 | 1.9 |
| Technical writers | (S) | (S) | (S) | (S) | 83 | 52.8 | 2.7 | 2.3 |
| Designers | 393 | 52.7 | 3.1 | 2.7 | 541 | 52.6 | 3.7 | 4.4 |
| Musicians and composers | 155 | 28.0 | 7.9 | 4.4 | 174 | 32.8 | 9.8 | 5.8 |
| Actors and directors | 60 | 30.8 | 6.6 | 3.4 | 96 | 38.3 | 10.4 | 4.7 |
| Painters, sculptors, craft-artists, and artist printmakers | 186 | 47.4 | 2.1 | 2.3 | 222 | 48.0 | 3.5 | 4.1 |
| Photographers | 113 | 20.7 | 4.0 | 3.4 | 135 | 26.2 | 6.5 | 7.1 |
| Editors and reporters | 204 | 48.4 | 2.9 | 2.1 | 256 | 48.5 | 5.0 | 3.4 |
| Public relations specialists | 157 | 50.1 | 6.2 | 1.9 | 155 | 59.6 | 7.0 | 3.5 |
| Athletes | 58 | 17.6 | 9.4 | 1.7 | 80 | 23.9 | 10.1 | 3.9 |

See footnotes at end of table.

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## No. 637. Employed Civilians, by Occupation, Sex, Race, and Hispanic Origin: 1983 and 1993—Continued

| OCCUPATION | 1983 | | | | 1993 | | | |
|---|---|---|---|---|---|---|---|---|
| | Total employed (1,000) | Percent of total | | | Total employed (1,000) | Percent of total | | |
| | | Female | Black | Hispanic | | Female | Black | Hispanic |
| Technical, sales, and administrative support | 31,265 | 64.8 | 7.6 | 4.3 | 36,614 | 63.8 | 9.3 | 6.3 |
| Technicians and related support | 3,453 | 46.2 | 8.2 | 2.1 | 4,014 | 50.5 | 9.6 | 5.0 |
| Health technologists and technicians | 1,111 | 84.0 | 12.7 | 3.1 | 1,522 | 81.0 | 12.4 | 5.8 |
| Clinical laboratory technologists and technicians | 255 | 76.2 | 10.5 | 2.9 | 315 | 75.1 | 12.1 | 6.1 |
| Dental hygienists | 56 | 98.6 | 1.6 | . | 76 | 99.3 | 0.4 | 2.0 |
| Health record technologists and technicians | (4) | (4) | (4) | (4) | 53 | 88.8 | 20.4 | 5.7 |
| Radiologic technicians | 101 | 71.7 | 8.6 | 4.5 | 146 | 70.2 | 8.3 | 7.0 |
| Licensed practical nurses | 442 | 97.0 | 17.7 | 3.1 | 425 | 94.6 | 17.2 | 3.4 |
| Engineering and related technologists and technicians | 822 | 18.4 | 6.1 | 3.5 | 870 | 17.8 | 7.4 | 4.9 |
| Electrical and electronic technicians | 260 | 12.5 | 8.2 | 4.6 | 297 | 15.5 | 7.4 | 5.6 |
| Drafting occupations | 273 | 17.5 | 5.5 | 2.3 | 244 | 18.1 | 6.9 | 5.9 |
| Surveying and mapping technicians | (4) | (4) | (4) | (4) | 73 | 5.0 | 4.8 | 2.8 |
| Science technicians | 202 | 29.1 | 6.6 | 2.8 | 261 | 37.5 | 7.2 | 5.2 |
| Biological technicians | 52 | 37.7 | 2.9 | 2.0 | 85 | 59.7 | 6.1 | 3.8 |
| Chemical technicians | 82 | 26.9 | 9.5 | 3.5 | 74 | 25.0 | 7.1 | 3.9 |
| Technicians, except health, engineering, and science | 917 | 35.3 | 5.0 | 2.7 | 1,361 | 39.9 | 8.4 | 4.0 |
| Airplane pilots and navigators | 59 | 2.1 | . | 1.6 | 101 | 3.9 | 5.5 | 2.4 |
| Computer programmers | 443 | 32.5 | 4.4 | 2.1 | 578 | 31.5 | 6.7 | 3.5 |
| Legal assistants | 128 | 74.0 | 4.3 | 3.6 | 254 | 79.6 | 8.6 | 4.9 |
| Sales occupations | 11,818 | 47.5 | 4.7 | 3.7 | 14,245 | 48.1 | 6.7 | 5.9 |
| Supervisors and proprietors | 2,958 | 29.4 | 3.6 | 3.4 | 4,016 | 36.4 | 4.4 | 5.3 |
| Sales representatives, finance and business services | 1,853 | 37.2 | 2.7 | 2.2 | 2,317 | 40.5 | 4.7 | 3.7 |
| Insurance sales | 551 | 25.1 | 3.8 | 2.5 | 583 | 33.3 | 5.1 | 3.8 |
| Real estate sales | 570 | 48.9 | 1.3 | 1.5 | 710 | 51.4 | 2.5 | 4.1 |
| Securities and financial services sales | 212 | 23.6 | 3.1 | 1.1 | 355 | 28.1 | 4.1 | 2.2 |
| Advertising and related sales | 124 | 47.9 | 4.5 | 3.3 | 161 | 50.8 | 4.5 | 3.1 |
| Sales representatives, commodities, except retail | 1,442 | 15.1 | 2.1 | 2.2 | 1,538 | 21.0 | 2.9 | 3.9 |
| Sales workers, retail and personal services | 5,511 | 69.7 | 6.7 | 4.8 | 6,281 | 64.9 | 9.7 | 7.5 |
| Cashiers | 2,009 | 84.4 | 10.1 | 5.4 | 2,581 | 78.4 | 13.2 | 8.7 |
| Sales-related occupations | 54 | 58.7 | 2.8 | 1.3 | 93 | 60.5 | 5.3 | 6.1 |
| Administrative support, including clerical | 16,395 | 79.9 | 9.6 | 5.0 | 18,555 | 78.8 | 11.2 | 6.8 |
| Supervisors | 676 | 53.4 | 9.3 | 5.0 | 778 | 58.4 | 11.9 | 6.6 |
| Computer equipment operators | 605 | 63.9 | 12.5 | 6.0 | 603 | 61.9 | 13.8 | 6.2 |
| Computer operators | 597 | 63.7 | 12.1 | 6.0 | 597 | 61.9 | 13.7 | 6.1 |
| Secretaries, stenographers, and typists | 4,861 | 98.2 | 7.3 | 4.5 | 4,174 | 96.2 | 8.9 | 5.9 |
| Secretaries | 3,891 | 99.0 | 5.8 | 4.0 | 3,588 | 98.9 | 7.7 | 5.8 |
| Typists | 906 | 95.6 | 13.8 | 6.4 | 494 | 84.3 | 18.8 | 7.4 |
| Information clerks | 1,174 | 88.9 | 8.5 | 5.5 | 1,678 | 88.8 | 9.3 | 7.9 |
| Receptionists | 602 | 96.8 | 7.5 | 6.6 | 899 | 97.2 | 8.6 | 7.6 |
| Records processing occupations, except financial | 866 | 82.4 | 10.9 | 4.8 | 908 | 79.1 | 14.9 | 6.6 |
| Order clerks | 188 | 78.1 | 10.6 | 4.4 | 212 | 78.1 | 17.1 | 6.5 |
| Personnel clerks, except payroll and time keeping | 64 | 91.1 | 14.9 | 4.8 | 63 | 89.2 | 15.2 | 3.9 |
| Library clerks | 147 | 81.9 | 15.4 | 2.5 | 146 | 75.9 | 11.6 | 3.4 |
| File clerks | 287 | 83.5 | 16.7 | 6.1 | 288 | 79.6 | 15.0 | 10.4 |
| Records clerks | 157 | 82.8 | 11.8 | 5.6 | 184 | 77.9 | 14.3 | 4.8 |
| Financial records processing | 2,457 | 89.4 | 4.6 | 3.7 | 2,272 | 89.9 | 5.4 | 5.3 |
| Bookkeepers, accounting, and auditing clerks | 1,970 | 91.0 | 4.3 | 3.3 | 1,806 | 90.9 | 4.5 | 4.9 |
| Payroll and time keeping clerks | 192 | 82.2 | 5.9 | 5.0 | 173 | 88.3 | 8.6 | 5.2 |
| Billing clerks | 145 | 88.4 | 6.2 | 3.9 | 160 | 88.5 | 8.4 | 6.6 |
| Cost and rate clerks | 96 | 75.8 | 5.9 | 5.3 | 60 | 72.9 | 10.9 | 9.7 |
| Billing, posting, and calculating machine operators | (4) | (4) | (4) | (4) | 72 | 86.1 | 12.0 | 8.2 |
| Duplicating, mail and other office machine operators | 88 | 62.6 | 16.0 | 6.1 | 83 | 47.8 | 19.2 | 9.2 |
| Communications equipment operators | 256 | 89.1 | 17.0 | 4.4 | 208 | 86.1 | 20.9 | 8.0 |
| Telephone operators | 244 | 90.4 | 17.0 | 4.3 | 197 | 86.9 | 21.0 | 7.9 |
| Mail and message distributing occupations | 799 | 31.6 | 18.1 | 4.5 | 953 | 37.6 | 19.0 | 7.4 |
| Postal clerks, except mail carriers | 248 | 36.7 | 26.2 | 5.2 | 297 | 44.8 | 26.8 | 6.8 |
| Mail carrier, postal service | 259 | 17.1 | 12.5 | 2.7 | 333 | 28.4 | 12.6 | 7.0 |
| Mail clerks, except postal service | 170 | 50.0 | 15.8 | 5.9 | 166 | 51.5 | 22.5 | 8.6 |
| Messengers | 122 | 28.2 | 16.7 | 5.2 | 157 | 29.1 | 14.2 | 7.9 |
| Material recording, scheduling, and distributing | 1,562 | 37.5 | 10.9 | 6.6 | 1,852 | 44.0 | 14.0 | 8.3 |
| Dispatchers | 157 | 45.7 | 11.4 | 4.3 | 221 | 52.7 | 11.8 | 5.7 |
| Production coordinators | 182 | 44.0 | 6.1 | 2.2 | 196 | 50.2 | 7.8 | 4.7 |
| Traffic, shipping, and receiving clerks | 421 | 22.6 | 9.1 | 11.1 | 570 | 30.9 | 15.1 | 11.9 |
| Stock and inventory clerks | 532 | 38.7 | 13.3 | 5.5 | 489 | 43.4 | 14.5 | 6.8 |
| Weighers, measurers, and checkers | 79 | 47.2 | 16.9 | 5.8 | 67 | 45.6 | 15.9 | 10.4 |
| Expediters | 112 | 57.5 | 8.4 | 4.3 | 227 | 67.0 | 13.9 | 7.1 |
| Adjusters and investigators | 675 | 69.9 | 11.1 | 5.1 | 1,372 | 74.0 | 12.2 | 6.1 |
| Insurance adjusters, examiners, and investigators | 199 | 65.0 | 11.5 | 2.3 | 372 | 71.5 | 12.1 | 4.0 |
| Investigators and adjusters, except insurance | 301 | 70.1 | 11.3 | 4.8 | 748 | 76.2 | 11.2 | 6.3 |
| Eligibility clerks, social welfare | 69 | 89.7 | 12.9 | 9.4 | 86 | 84.7 | 16.2 | 6.0 |
| Bill and account collectors | 106 | 66.4 | 8.5 | 6.5 | 166 | 64.3 | 14.8 | 9.5 |
| Miscellaneous administrative support | 2,397 | 65.2 | 12.5 | 5.9 | 3,694 | 82.3 | 12.4 | 7.8 |
| General office clerks | 648 | 80.6 | 12.7 | 5.2 | 731 | 82.0 | 11.4 | 9.6 |
| Bank tellers | 480 | 91.0 | 7.5 | 4.3 | 446 | 88.4 | 6.9 | 6.2 |
| Data entry keyers | 311 | 93.6 | 18.6 | 5.6 | 623 | 82.4 | 16.4 | 8.3 |
| Statistical clerks | 96 | 75.7 | 7.5 | 3.4 | 50 | 78.4 | 15.4 | 3.3 |
| Teachers' aides | 348 | 93.7 | 17.8 | 12.8 | 508 | 92.2 | 15.7 | 12.3 |

See footnotes at end of table.



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## No. 637. Employed Civilians, by Occupation, Sex, Race, and Hispanic Origin: 1983 and 1993—Continued

| OCCUPATION | 1983 | | | | 1993 | | | |
|---|---|---|---|---|---|---|---|---|
| | Total employed (1,000) | Percent of total | | | Total employed (1,000) | Percent of total | | |
| | | Female | Black | Hispanic | | Female | Black | Hispanic |
| Service occupations | 13,857 | 50.1 | 16.6 | 8.8 | 16,522 | 53.5 | 17.3 | 11.2 |
| Private household | 950 | 96.1 | 27.8 | 8.5 | 912 | 95.1 | 17.1 | 21.6 |
| Child care workers | 408 | 96.9 | 7.9 | 3.6 | 345 | 97.2 | 9.0 | 15.0 |
| Cleaners and servants | 512 | 95.6 | 42.4 | 11.8 | 534 | 94.0 | 21.6 | 25.7 |
| Protective service | 1,672 | 12.9 | 13.6 | 4.5 | 2,162 | 17.2 | 17.4 | 6.6 |
| Supervisors, protective service | 127 | 4.7 | 7.7 | 3.1 | 185 | 7.5 | 12.2 | 4.8 |
| Supervisors, police and detectives | 58 | 4.2 | 9.3 | 1.2 | 96 | 10.3 | 5.6 | 6.1 |
| Firefighting and fire prevention | 189 | 1.0 | 5.7 | 4.1 | 208 | 3.7 | 7.6 | 4.5 |
| Firefighting occupations | 170 | 1.0 | 7.3 | 3.8 | 188 | 3.3 | 7.5 | 5.0 |
| Police and detectives | 545 | 9.4 | 13.1 | 4.0 | 923 | 16.0 | 18.0 | 5.4 |
| Police and detectives, public service | 412 | 5.7 | 9.5 | 4.4 | 511 | 12.0 | 14.5 | 5.9 |
| Sheriffs, bailiffs, and other law enforcement officers | 87 | 10.2 | 11.5 | 4.0 | 117 | 19.5 | 13.4 | 4.6 |
| Correctional institution officers | 146 | 17.8 | 24.0 | 2.8 | 295 | 21.5 | 25.8 | 5.0 |
| Guards | 711 | 20.6 | 17.0 | 5.6 | 836 | 23.9 | 20.4 | 8.8 |
| Guards and police, except public service | 502 | 13.0 | 18.9 | 6.2 | 711 | 17.2 | 22.6 | 9.5 |
| Service except private household and protective | 11,235 | 54.0 | 16.0 | 6.9 | 13,457 | 58.9 | 17.3 | 11.2 |
| Food preparation and service occupations | 4,860 | 53.3 | 10.5 | 6.8 | 5,691 | 58.4 | 12.9 | 11.7 |
| Bartenders | 308 | 48.4 | 2.7 | 4.4 | 321 | 53.3 | 3.8 | 3.1 |
| Waiters and waitresses | 1,357 | 87.8 | 4.1 | 3.6 | 1,414 | 80.0 | 4.6 | 7.5 |
| Cooks | 1,452 | 50.0 | 15.8 | 6.5 | 1,992 | 44.2 | 19.0 | 13.9 |
| Food counter, fountain, and related occupations | 326 | 76.0 | 9.1 | 5.7 | 357 | 69.2 | 12.5 | 8.1 |
| Kitchen workers, food preparation | 138 | 77.0 | 10.7 | 8.1 | 250 | 75.3 | 15.0 | 10.8 |
| Waiters' and waitresses' assistants | 364 | 38.8 | 12.6 | 14.2 | 368 | 43.7 | 11.4 | 18.1 |
| Health service occupations | 1,739 | 89.2 | 23.5 | 4.8 | 2,213 | 87.4 | 27.3 | 7.7 |
| Dental assistants | 154 | 98.1 | 6.1 | 5.7 | 181 | 97.8 | 3.4 | 10.4 |
| Health aides, except nursing | 315 | 86.8 | 16.5 | 4.8 | 312 | 78.9 | 22.2 | 4.7 |
| Nursing aides, orderlies, and attendants | 1,269 | 88.7 | 27.3 | 4.7 | 1,719 | 87.9 | 30.7 | 7.9 |
| Cleaning and building service occupations | 2,736 | 38.8 | 24.4 | 9.2 | 2,959 | 42.2 | 22.4 | 16.2 |
| Maids and housemen | 531 | 81.2 | 32.3 | 10.1 | 561 | 81.7 | 27.3 | 18.6 |
| Janitors and cleaners | 2,031 | 28.6 | 22.6 | 8.9 | 2,086 | 30.7 | 21.5 | 16.1 |
| Personal service occupations | 1,870 | 79.2 | 11.1 | 6.0 | 2,594 | 80.7 | 12.9 | 7.6 |
| Barbers | 92 | 12.9 | 8.4 | 12.1 | 86 | 22.3 | 27.5 | 8.5 |
| Hairdressers and cosmetologists | 622 | 88.7 | 7.0 | 5.7 | 758 | 90.1 | 9.4 | 6.3 |
| Attendants, amusement and recreation facilities | 131 | 40.2 | 7.1 | 4.3 | 161 | 39.4 | 7.4 | 5.8 |
| Public transportation attendants | 53 | 74.3 | 11.3 | 5.9 | 104 | 80.4 | 8.8 | 7.4 |
| Welfare service aides | 77 | 92.5 | 24.2 | 10.5 | 73 | 82.1 | 21.2 | 16.6 |
| Family child care providers | (NA) | (NA) | (NA) | (NA) | 302 | 99.0 | 9.4 | 10.2 |
| Early childhood teachers' assistants | (NA) | (NA) | (NA) | (NA) | 418 | 96.6 | 15.7 | 6.4 |
| Precision production, craft, and repair | 12,328 | 8.1 | 6.8 | 6.2 | 13,326 | 8.6 | 7.4 | 9.2 |
| Mechanics and repairers | 4,158 | 3.0 | 6.8 | 5.3 | 4,416 | 3.5 | 7.3 | 7.9 |
| Mechanics and repairers, except supervisors | 3,906 | 2.8 | 7.0 | 5.5 | 4,196 | 3.3 | 7.3 | 8.1 |
| Vehicle and mobile equipment mechanics/repairers | 1,683 | 0.8 | 6.9 | 6.0 | 1,800 | 1.0 | 6.1 | 9.9 |
| Automobile mechanics | 800 | 0.5 | 7.8 | 6.0 | 854 | 0.6 | 6.4 | 10.8 |
| Aircraft engine mechanics | 95 | 2.5 | 4.0 | 7.6 | 139 | 4.1 | 5.1 | 11.5 |
| Electrical and electronic equipment repairers | 674 | 7.4 | 7.3 | 4.5 | 655 | 9.5 | 9.0 | 5.8 |
| Data processing equipment repairers | 98 | 9.3 | 6.1 | 4.5 | 152 | 10.7 | 10.2 | 5.0 |
| Telephone installers and repairers | 247 | 9.9 | 7.8 | 3.7 | 188 | 12.5 | 9.9 | 3.4 |
| Construction trades | 4,299 | 1.8 | 6.8 | 6.0 | 5,004 | 1.9 | 6.5 | 9.5 |
| Construction trades, except supervisors | 3,784 | 1.9 | 7.1 | 6.1 | 4,269 | 1.9 | 7.0 | 10.2 |
| Carpenters | 1,160 | 1.4 | 5.0 | 5.0 | 1,278 | 0.9 | 4.5 | 7.7 |
| Extractive occupations | 196 | 2.3 | 3.3 | 6.0 | 148 | 1.8 | 4.6 | 7.9 |
| Precision production occupations | 3,685 | 21.5 | 7.3 | 7.4 | 3,758 | 23.6 | 8.8 | 10.5 |
| Operators, fabricators, and laborers | 16,091 | 28.6 | 14.0 | 8.3 | 17,038 | 24.5 | 14.9 | 12.1 |
| Machine operators, assemblers, and inspectors | 7,744 | 42.1 | 14.0 | 9.4 | 7,415 | 36.7 | 14.7 | 13.8 |
| Textile, apparel, and furnishings machine operators | 1,414 | 82.1 | 16.7 | 12.5 | 1,159 | 74.4 | 20.8 | 19.9 |
| Textile sewing machine operators | 806 | 94.0 | 15.5 | 14.5 | 616 | 85.8 | 18.5 | 24.1 |
| Pressing machine operators | 141 | 56.4 | 27.1 | 14.2 | 147 | 62.7 | 24.0 | 20.4 |
| Fabricators, assemblers, and hand working occupations | 1,715 | 33.7 | 11.3 | 8.7 | 1,882 | 32.7 | 12.7 | 12.0 |
| Production inspectors, testers, samplers, and weighers | 794 | 53.8 | 13.0 | 7.7 | 777 | 52.4 | 15.0 | 13.7 |
| Transportation and material moving occupations | 4,201 | 7.8 | 13.0 | 5.9 | 5,004 | 9.3 | 14.0 | 8.6 |
| Motor vehicle operators | 2,978 | 9.2 | 13.5 | 6.0 | 3,625 | 10.8 | 14.2 | 8.9 |
| Trucks, heavy and light | 2,195 | 3.1 | 12.3 | 5.7 | 2,786 | 4.5 | 12.3 | 8.8 |
| Transportation occupations, except motor vehicles | 212 | 2.4 | 6.7 | 3.0 | 170 | 4.1 | 10.2 | 3.1 |
| Material moving equipment operators | 1,011 | 4.8 | 12.9 | 6.3 | 1,009 | 4.5 | 13.9 | 8.5 |
| Industrial truck and tractor operators | 369 | 5.6 | 19.6 | 8.2 | 432 | 7.3 | 20.9 | 12.0 |
| Handlers, equipment cleaners, helpers, and laborers | 4,147 | 16.8 | 15.1 | 8.6 | 4,619 | 18.3 | 16.1 | 12.9 |
| Freight, stock, and material handlers | 1,488 | 15.4 | 15.3 | 7.1 | 1,850 | 20.7 | 16.7 | 9.9 |
| Laborers, except construction | 1,024 | 19.4 | 16.0 | 8.6 | 1,127 | 17.0 | 16.7 | 13.7 |
| Farming, forestry, and fishing | 3,700 | 16.0 | 7.5 | 8.2 | 3,326 | 15.4 | 6.3 | 16.0 |
| Farm operators and managers | 1,450 | 12.1 | 1.3 | 0.7 | 1,170 | 14.3 | 0.9 | 2.4 |
| Other agricultural and related occupations | 2,072 | 19.9 | 11.7 | 14.0 | 1,963 | 17.0 | 9.5 | 24.8 |
| Farm workers | 1,149 | 24.8 | 11.6 | 15.9 | 801 | 20.0 | 7.0 | 28.5 |
| Forestry and logging occupations | 126 | 1.4 | 12.8 | 2.1 | 132 | 5.9 | 10.4 | 11.8 |
| Fishers, hunters, and trappers | 53 | 4.5 | 1.8 | 2.5 | 61 | 4.4 | 1.7 | 4.8 |

- Represents or rounds to zero. NA Not available. [1] Includes other occupations, not shown separately. [2] Level of total employment below 50,000. [3] Includes clerks.

Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, monthly, January issues.



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TABLE 11

Baccalaureate Degrees Conferred in Specific Disciplines by Selected Institutes by Race/Ethnic Group, United States, 1978 79

| Discipline | Black | | Hispanic | | Asian | | Native American | | Nonminority | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % | Number | % |
| Agriculture & natural resources | 312 | 0.6 | 165 | 1.0 | 277 | 2.2 | 68 | 2.7 | 14058 | 1.1 |
| Architecture & environmental design | 250 | 0.5 | 207 | 1.3 | 196 | 1.6 | 23 | 0.9 | 5488 | 1.1 |
| Area studies | 64 | 0.1 | 70 | 0.4 | 72 | 0.6 | 2 | 0.1 | 1219 | 0.1 |
| Biological sciences | 2065 | 4.2 | 852 | 5.3 | 1172 | 9.5 | 110 | 4.4 | 22337 | 5.1 |
| Business and management | 9412 | 19.2 | 2549 | 15.9 | 2606 | 21.0 | 361 | 14.4 | 76853 | 18.5 |
| Communications | 1706 | 3.5 | 356 | 2.2 | 242 | 2.0 | 56 | 2.2 | 15717 | 3.8 |
| Computer & information sciences | 444 | 0.9 | 131 | 1.7 | 213 | 1.7 | 9 | 0.4 | 4581 | 1.1 |
| Education | 9870 | 20.1 | 2537 | 15.8 | 601 | 4.8 | 513 | 20.5 | 49848 | 12.0 |
| Engineering | 1411 | 2.9 | 930 | 5.8 | 1536 | 12.6 | 131 | 5.2 | 32766 | 7.9 |
| Fine & applied arts | 1362 | 2.8 | 542 | 3.4 | 538 | 4.3 | 118 | 4.7 | 18609 | 4.5 |
| Foreign languages | 256 | 0.5 | 786 | 4.9 | 182 | 1.5 | 18 | 0.7 | 5062 | 1.2 |
| Health professions | 2640 | 5.4 | 780 | 4.9 | 784 | 6.3 | 133 | 5.3 | 27157 | 6.5 |
| Home economics | 1045 | 2.1 | 141 | 0.9 | 351 | 2.8 | 66 | 2.6 | 9899 | 2.4 |
| Letters | 1673 | 3.4 | 469 | 2.9 | 334 | 2.7 | 81 | 3.2 | 18170 | 4.4 |
| Library science | 44 | 0.1 | 2 | – | 2 | – | 2 | 0.1 | 245 | 0.1 |



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TABLE II
(CONT.)

Baccalaureate Degrees Conferred in Specific Disciplines by Selected Institutes by Race/Ethnic Group, United States, 1978-79

| Discipline | Black | | Hispanic | | Asian | | Native American | | Nonminority | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % | Number | % |
| Mathematics | 550 | 1.1 | 146 | 0.9 | 238 | 1.9 | 30 | 1.2 | 4709 | 1.1 |
| Physical sciences | 556 | 1.1 | 240 | 1.5 | 273 | 2.2 | 44 | 1.8 | 10188 | 2.5 |
| Psychology | 2495 | 5.1 | 986 | 6.2 | 652 | 5.3 | 137 | 5.5 | 18826 | 4.5 |
| Public affaind and services | 3704 | 7.5 | 1052 | 6.4 | 353 | 2.8 | 144 | 5.8 | 16797 | 4.0 |
| Social sciences | 7166 | 14.6 | 2382 | 14.9 | 1288 | 10.4 | 338 | 13.5 | 47392 | 11.4 |
| Interdisciplinary studies | 1977 | 4.1 | 722 | 4.5 | 478 | 3.9 | 118 | 4.7 | 15123 | 3.6 |
| All others | 94 | 0.2 | 19 | 0.1 | 6 | 0.1 | 2 | 0.1 | 252 | 0.1 |
| Total | 49116 | 100.0 | 16037 | 100.0 | 12394 | 100.0 | 25035 | 100.0 | 415476 | 100.0 |

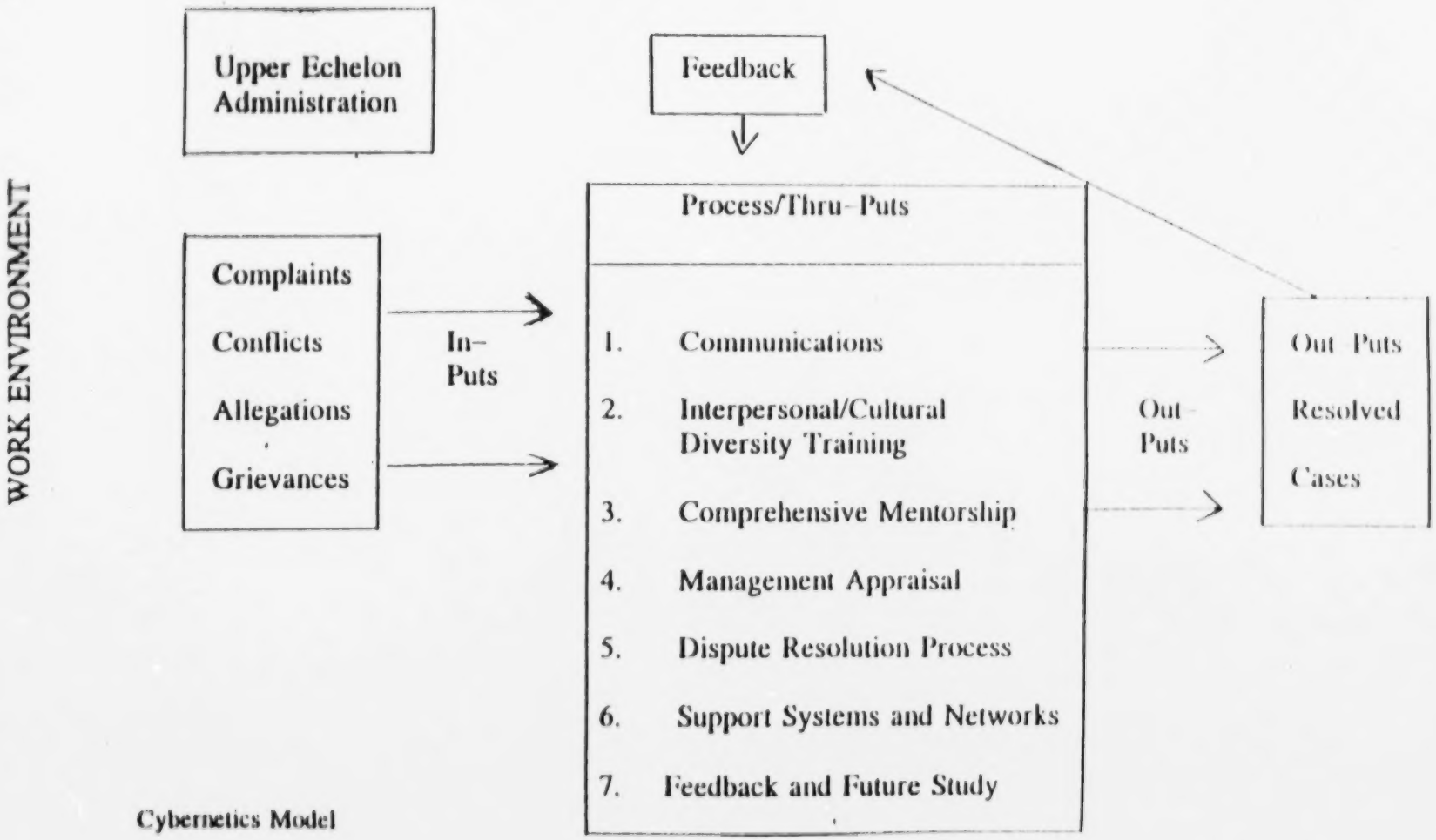
TABLE III

Number of Doctoral Degrees Conferred in Specific Disciplines by all Institutions by Sex and Race/Ethnic Group, United States, 1989

| | Arts & Humanities | Business & Management | Education | Engineering | Life Sciences | Physical Sciences | Social Sciences | Professional Fields |
|---|---|---|---|---|---|---|---|---|
| Degrees conferred [a] | 2,928 | 726[b] | 5,357 | 2,218[b] | 4,770 | 3,489[b] | 4,411 | 845 |
| Sex | | | | | | | | |
| Male | 54.5% | 73.9% | 42.5% | 91.8% | 61.8% | 81.2% | 54.8% | 56.1% |
| Female | 45.5% | 26.1% | 57.5% | 8.2% | 38.2% | 18.8% | 45.2% | 43.6% |
| Racial/Ethnic Group[c] | | | | | | | | |
| Native American | 6 | 1 | 21 | 7 | 14 | 18 | 17 | 6 |
| Asian | 84 | 49 | 102 | 359 | 248 | 251 | 136 | 28 |
| Black | 82 | 16 | 429 | 31 | 100 | 45 | 185 | 54 |
| Puerto Rican | 23 | 1 | 54 | 7 | 29 | 24 | 35 | 4 |
| Mexican American | 23 | 2 | 48 | 13 | 24 | 14 | 43 | 5 |
| Other Hispanics | 61 | 7 | 64 | 27 | 48 | 45 | 66 | 11 |
| White | 2,582 | 635 | 4,591 | 1,718 | 4,212 | 3,001 | 3,861 | 729 |
| Other or unknown | 67 | 15 | 48 | 56 | 95 | 91 | 70 | 8 |

Source: Data from the Chronicle of Higher Education Almanac, August 28, 1991, p. 27. Courtesy, National Research Council.
[a]Figures cover only U.S. citizens and those with permanent visas.
[b]Foreign students in 1989 received 42.4% of the doctoral degrees in engineering, 28% in physical sciences, and 24.5% in business and management.
[c]Percentages cover U.S. citizens and those with permanent and temporary visas.

Figure 1. Cybernetics Model




Cybernetics Model